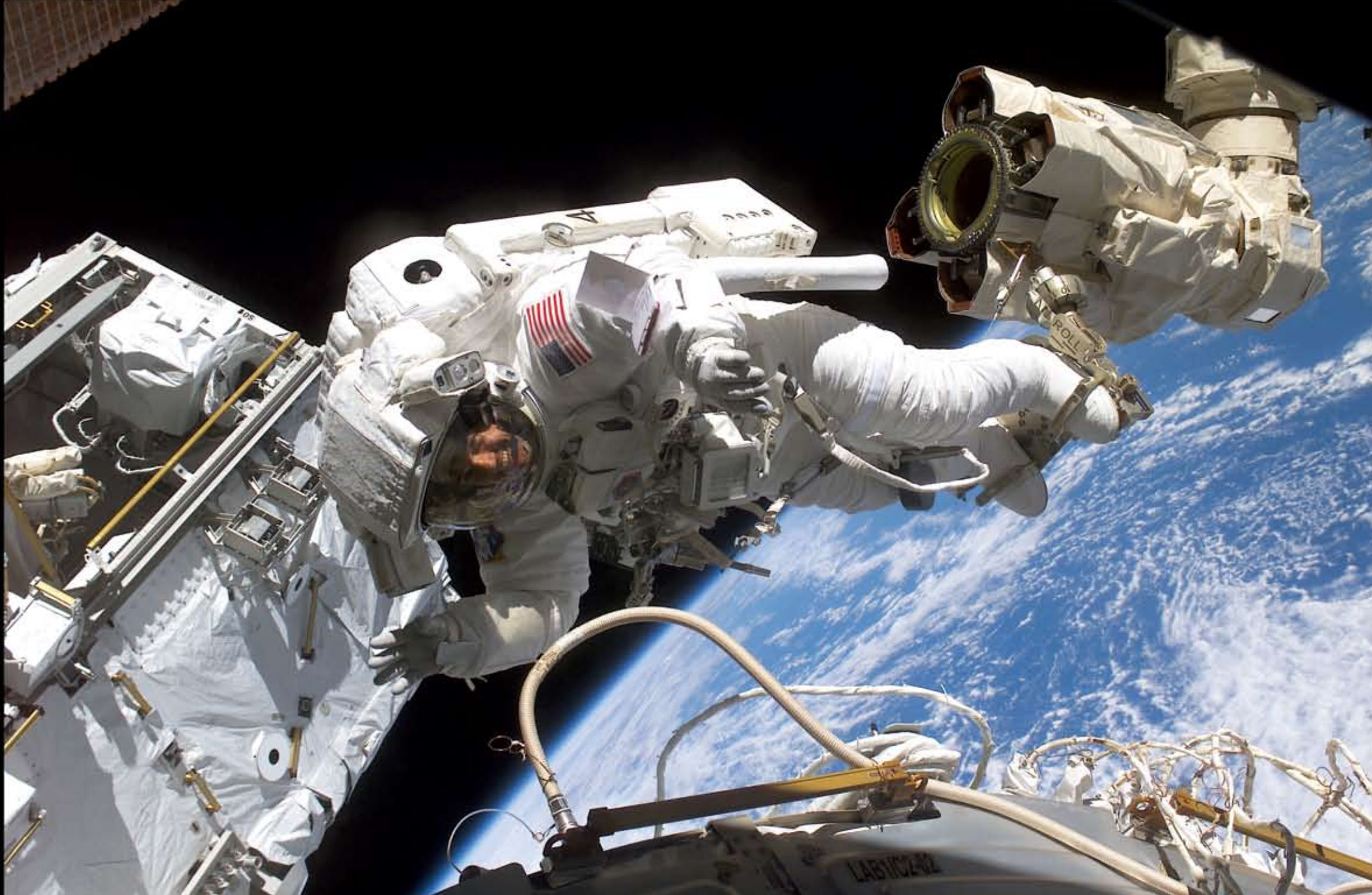


Conquering the Final Frontier

courtesy photo



Astronaut Col. Rex Walheim walks in space during a shuttle mission.

Airmen's support is out of this world

by Staff Sgt. Matthew Rosine
photos by Tech. Sgt. Larry Simmons

Col. Rex Walheim is both scared and exhilarated. He will be going first this time.

Less than 10 minutes away from his second spacewalk, a familiar voice comes on over the radio.

"It's five minutes to sunset."

"Oh, no," he thinks. In space, at night, everything is dark — completely dark.

Time steadily ticks away, and soon, it's time to start. Colonel Walheim turns the crank on the hatch of the space station floor. It locks firmly into place on the front wall, and he positions himself over the black portal. He gazes into the black oblivion 250 miles above the Earth. Now comes the hard part. He has to dive head first into the cold nothingness of space.

"You are tethered inside the airlock so you know you're not going anywhere," the astronaut said. "But the act of going out head first when it is pitch black outside — it really gets your attention."

"That first dive out is a doozy, especially when you are going out first," he said. "When you go out second, you go out legs first, so it's not quite as difficult or as scary."

The right stuff

Colonel Walheim's experience isn't unique. Other Airmen have been in space. Today, he is only one of the many Airmen directly and indirectly supporting NASA operations.

From the astronauts who fly the missions to the scientists who work on experiments at the Johnson Space Center in Houston, Airmen support the full spectrum of NASA missions.

"What (Airmen) bring to the table is that we're very much in the business of operations," said retired Col. Steve Lindsey, chief of the astronaut office. "Air Force folks bring operational expertise, because that's what we're about in the Air Force. So we take advantage of all the Air Force training and operational experience — that's why they are so attractive (to NASA)."

And proper training is something critical to mission success at NASA.

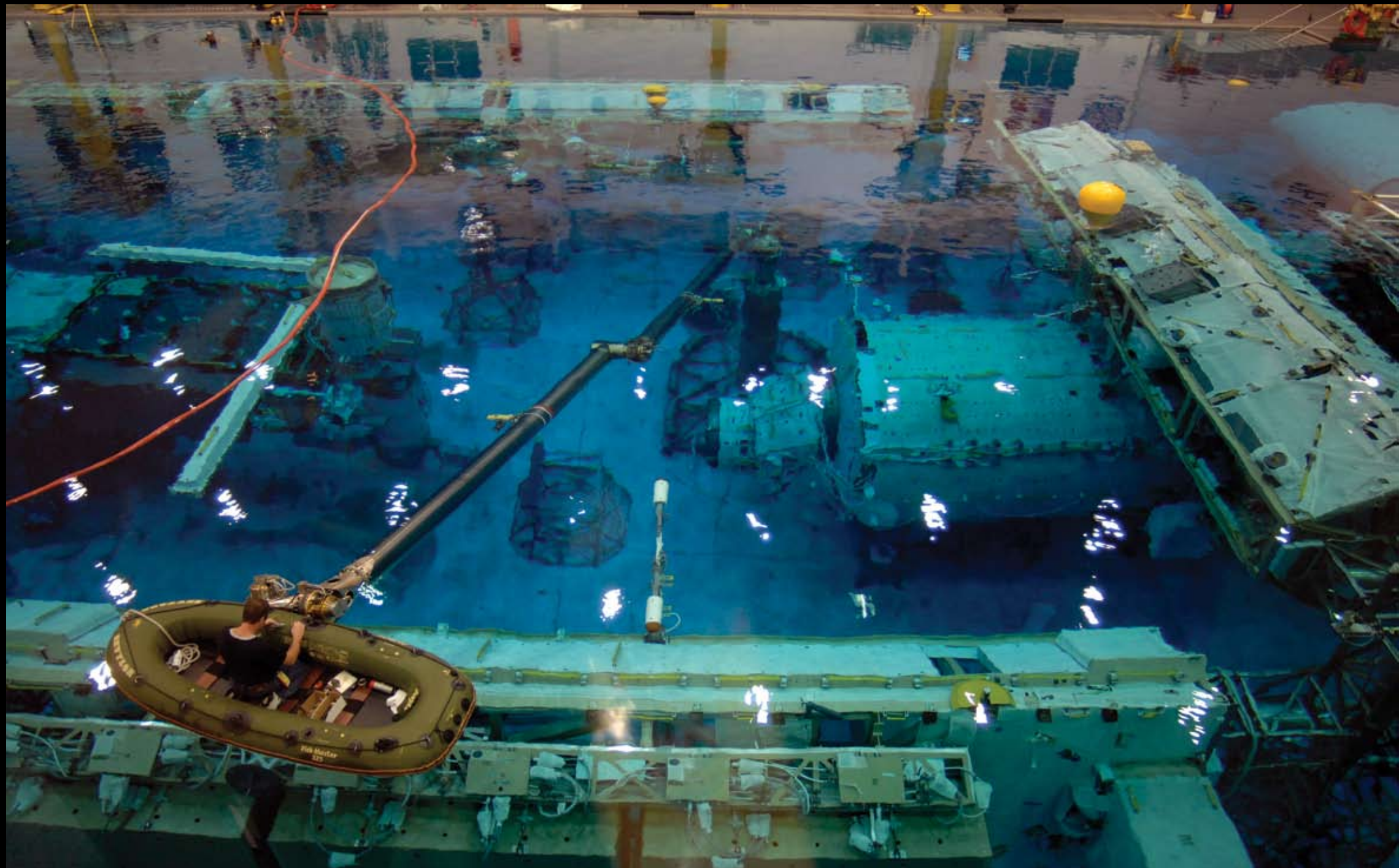
"There is an incredible amount of training," Air Force astronaut Lt. Col. James Dutton said. "Normally, crews will begin training in earnest about a year prior, and a lot of the training you have had prior to that is analogous to Air Force pilot training."

The training Airmen receive before working at NASA helps prepare them for success against any challenge.

"The Air Force prepared me well," Colonel Dutton said. "I



Col. Rex Walheim practices departing from a shuttle for an upcoming mission. The colonel's first outer space mission was STS-110 Atlantis where he was a mission specialist. A technician inside the neutral buoyancy lab at Houston's Johnson Space Center (left), works in a full-sized mock-up of the International Space Station. The lab is the world's largest indoor pool. It contains 6.2 million gallons of water.



think it is just that competing demand to keep all the plates spinning, and I think with most Air Force jobs, it is the same thing. We are doing more with less people. Everyone has to be able to multi-task."

That means every astronaut must be in top physical condition. Helping ensure the health and well-being of each astronaut are Air Force flight surgeons, with their varied medical expertise.

"Sometimes (astronauts) may be in the 'queue' for almost 10 years before they fly. So keeping them healthy with preventive medicine is of paramount importance," said Col. (Dr.) J.T. Polk, chief of NASA's medical operations branch flight surgeons' cadre.

These motivated Airmen also perform many valuable non-traditional roles for the NASA mission, including being an integral part of engineering systems that affect human beings. They

work in mission control and support American astronauts working with cosmonauts.

"The absolute best thing is that this is a profession and mission that is constantly evolving and changing," Colonel Polk said.

Space age warfighters

Evolution and change are also NASA traits. Keeping tabs of he changes is a group of Airmen who work in a small office nestled deep inside mission control. Their motto is "space technology for the warfighter."

The Airmen make up the Department of Defense Spaceflight Payload Office. Part of the DOD Space Test Program, they support three kinds of missions: Shuttle and International Space Station payloads and deploying payloads on the outside of the space station.

While they don't create the experiments, these spaceflight payload specialists fight to keep a DOD presence on every mission.

"We operate in the deliberate balance between safety and science," Maj. Matthew Budde said. He is a human spaceflight payload manager. "As often as we can, we get some kind of experiment on every space shuttle mission."

While this little-known office has only four people – three Airmen and one civilian – it performs a big mission for America's warfighters.

"We are a technology development unit," Major Budde said. "Eventually these experiments will evolve into operational capabilities. DOD is really helping pave the way for science."

The office's most recent accomplishment was successfully launching two perfectly spherical satellites during mission STS-116. This was the first time shuttle crews used a canister pay-

load deployment system for satellites, and the spaceflight payload office built the launcher. The two satellites measure the actual drag on satellites in the Earth's atmosphere.

"With a better model of the Earth's atmosphere, we could dramatically improve theater operations for military satellites," said Maj. Stephen McGrath, a reservist who also works at NASA on the flight control team as a civilian. "We are always planning for future events and forward thinking. Getting these payloads flown is very important because these systems can help our warfighters in the future."

Making a difference

Like many NASA operations, Airmen work each day to help each mission. Some are there making a difference before, during and after the missions.

"Basically, our mission here is to provide and coordinate

DOD support for all of the space shuttle launches and landings,” said Lt. Col. David Impiccini, a landing support officer.

The landing support office works with the flight control team in mission control and coordinates for mission success around the world, especially when Americans are flying with their Russian counterparts. But as Airmen, they also bring their own unique abilities to the job.

“Probably the most valuable (thing) we provide to NASA is the aviation experience that we have,” the former Air Force helicopter pilot said.

And it is the experience, expertise and professionalism Airmen provide NASA that helps astronauts like Colonel Walheim succeed.

The colonel looks out the bottom of the space station into infinite darkness and slowly dives head first out the hatch. He grabs onto a handrail, guiding the rest of his body out of the airlock.

Floating 250 miles above the Earth, he listens to the fan in his space suit hum steadily until a voice comes on over the radio.

“Welcome to the fraternity of spacewalking.” Astronauts aren’t officially in “the club” until they go out first.

Colonel Walheim doesn’t have time to revel in his personal accomplishment. As a mission specialist, he has a mission to complete. ✈



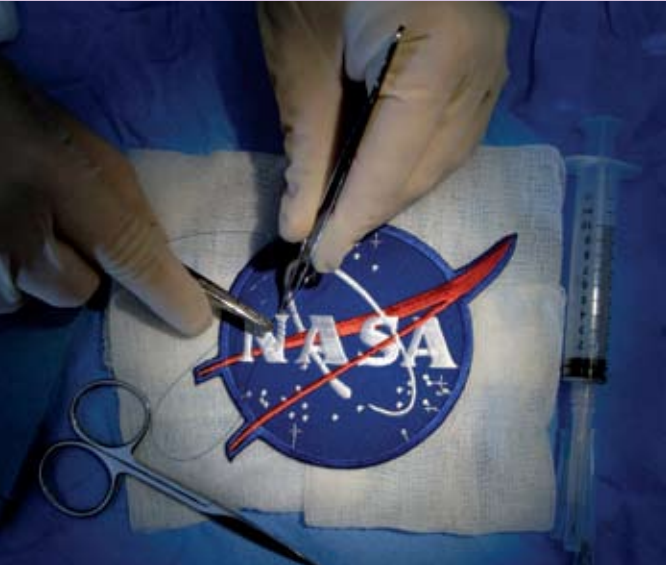
Astronauts work in NASA's Mission Control Center during a shuttle mission to the International Space Station.

Keeping them in stitches

Air Force flight surgeons keep astronauts flying

It is difficult for most Air Force doctors to make house calls, especially when the patient is in outer space. However, seven Air Force flight surgeons answered the call to keep America's astronauts fit to fly.

“We take care of the astronaut corps,” said Col. (Dr.) J.T. Polk, chief of NASA's medical operations branch flight surgeons' cadre. NASA has 10 military flight surgeons, seven Airmen, two Sailors and one Soldier.



A flight surgeon “works” on a NASA patch to illustrate how these doctors help keep astronauts in flying.

Since all NASA astronauts have to pass a modified Air Force Class 3 physical, the medics bring extra experience to the job.

“There are modifications based on space-flight physiology,” Colonel Polk said. “Things that you wouldn’t have to worry about in a particular aviation environment, we do worry about in a space-flight environment.”

For example, bone loss and kidney stones are a big concern for astronauts because of the effects of long-duration space flight.

“After each mission, we want to return them to their pre-launch health,” said Lt. Col. (Dr.) David Alexander, a NASA flight surgeon and Texas Air National Guardsman with the 149th Fighter Wing. “Astronauts can suffer up to 1 to 2 percent bone loss per month while in space. It can take a couple of years for them to recover after an (International Space Station) mission.”

To help astronauts stay healthy in their unique environment, flight surgeons undergo extensive training.

“The training aspect for the NASA flight docs is huge,” Colonel Polk said. “Most people don’t realize how much training is required to be considered a part of the space cadre or to take care of the space cadre. It is not just doing the physicals on the astronauts and hoping for the best.”

Flight surgeons add 572 hours of additional training beyond their Air Force flight surgeon training. This training is required for different vehicles, engineering systems, human factors and human systems engineering. It can take two years to finish the proper training.

The Airmen also bring their ability to do more with less to their current profession. They are an integral part of human systems integration for vehicles NASA is developing. They work with the life support, launch and landing criteria and in vehicle design. They also support each mission, in mission control, as one of the flight controllers. Flight surgeons are the main medical consul-

tants to the flight director during a mission. They also deploy with the NASA team around the world when working with their partners in space.

“We support our astronauts in Russia who are working toward their mission with the International Space Station,” Colonel Polk said. “Typically, the flight surgeons will spend three months at a time twice a year in Russia with our crews.”

Whatever the challenge, whether performing family practice medicine on astronaut families at home or their medical specialties while deployed overseas, Air Force flight surgeons are ready to succeed.

“The absolute best thing is that this is a profession and mission that is constantly evolving and changing,” Colonel Polk said. “While most people think of the 1960s as the dawn of the space era, it is not over and it is still blossoming.”

Col. (Dr.) Keith Brandt (left) and Lt. Col. (Dr.) David Alexander view the chest X-rays of an astronaut taken during a routine exam. The flight surgeons keep crewmembers healthy before and after missions and study the effects of space flight.

